Teacher Notes: Jeopardy Quiz Review

1.Link to online Jeopardy Game (the game can also be downloaded if internet access isn’t available)

http://www.superteachertools.com/jeopardy/usergames/Feb201207/game1329692254.php

2.Jeopardy Questions

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| **Reaction Rates** | **Le Chatelier’s Principle** | **Predict the Outcome** | **Definitions** | **Equilibrium Constant** |
| Q: What can you do to the temperature to slow down a chemical reaction?  A: decrease it | Q: An increase in temperature shifts an exothermic reaction in which direction?  A: to the left (towards reactants) | Q: What is the equilibrium constant expression for the following reaction:  N2 + 3H2 eqarrow 2NH3  A: K= (NH3)2/ (N2)(H2)3 | Q: A system that may exchange energy but not matter with its surroundings  A: Closed system | Q: what is the equilibrium law expression for the general chemical reaction:  aA + dDeqarrowcC + bB  A: K= [C]c[B]b/[A]a[D]d |
| Daily Double  Q: given large crystals of sodium chloride, what can be done to speed up a chemical reaction?  A: crush it/break it | Q: An increase in concentration of a reactant shifts a reaction in which direction  A: to the right (towards the products) | Q: For the reaction: 2Aeqarrow B + C: what is K equal to if (A) = 1.0 M, (B) = 2.0 M, and (C) = 2.0 M  A: K=4.0 | Q: A balance between forward and reverse processes occurring at the same rate  A: Dynamic equilibrium | Q: If K is a very, very large number then which side of the reaction is favored  A: product side |
| Q: These speed up chemical reactions without being changed or consumed  A: catalysts | Q: An increase in pressure shifts a reaction in which direction?  A: To the side with fewer moles of gas | Q: What will happen to the concentration of Pb2+(aq) in the following equilibrium if PbCl(s) is added to the container?  PbCl2eqarrow Pb2+ + 2Cl-  A: increase | Daily double  Q: Reversible Reaction  A: A reaction that can achieve equilibrium in the forward or reverse direction | Q: If K is very, very small, which side of the reaction is favored?  A: reactant side |
| Q: Why does granulated sugar dissolve in water faster than sugar cubes?  A: increased surface area | Q: A decrease in temperature shifts an exothermic reaction in which direction?  A: to the right (towards the reactants) | Q: Given that K= 0.5 and Q= 0.5, in what direction does the reaction have to shift in order to attain equilibrium?  A: No shift, it is already at equilibrium | Q: Le Chatelier’s Principle  A: when a chemical system at equilibrium is disturbed by a change in a property, the system adjusts in a way that opposes the change. | Q: If K = 1.0 which side of the Reaction is favored?  A: neither |
| Q: Name 2 variables that do not affect chemical equilibria?  A: catalysts and inert gases | Q: An increase in concentration of a product shifts an reaction in which direction?  A: to the left (towards reactants) | Q: Given that K=0.45 and Q=0.07, in what direction does the reaction have to shift in order to attain equilibrium?  A: to the right (towards the products) | Q: Homogeneous equilibria  A: equilibria in which all entities are in the same phase. | Q: How is Q different than K?  A: Concentrations for K are at equilibrium, while the concentrations for Q may or may not be at equilibrium |

Final Jeopardy Question:

Q: When 4.00 mols hydrogen and 2.00 mols iodine are places in a 2.00 L closed container at 440oC, they react to form hydrogen iodine. At this temperature, the equilibrium constant, K, is 49.7. What are the concentrations of the products and reactants at equilibrium?

How would you go about solving this problem? List the steps you would take. Hint, it should take about 10 steps.

A:

1. Write the balanced equation and known values
2. Write the equilibrium constant equation
3. Determine and list the initial concentrations
4. Calculate Q and compare to K. Determine If the system is at equilibrium, if it is not, decide in which direction it must proceed to attain equilibrium
5. Construct an ICE table and input initial concentration values
6. Let x represent the changes in concentration and fill in the “change” and “equilibrium” rows of the ICE table
7. Substitute equilibrium concentrations into the equilibrium constant equation
8. If possible, apply appropriate simplifying assumptions
9. Solve for x
10. Calculate the equilibrium concentrations by substituting x into the equilibrium concentration expressions from the “equilibrium” row of the ICE table.